

LISTING OF THE CLAIMS

The following listing, if entered, replaces all prior versions of the claims in the present application.

1-66. (Cancelled)

67. (Previously Presented) A method comprising:
for each of a plurality of media access control (MAC) devices to which data is to be transmitted over a network, providing a corresponding queue;
receiving data, from a local client, destined for a client of a first MAC device of the plurality of MAC devices;
storing at least a portion of the data in a first queue corresponding to the first MAC device;
receiving information generated by the client of the first MAC device indicating a need to change an amount of data being transmitted to the client of the first MAC device; and
selectively transmitting data stored in the first queue to the first MAC device,
wherein
a rate at which the selectively transmitting is performed is based at least in part on at least a portion of the information indicating the need to change the amount of data being transmitted to the client of the first MAC device.

68. (Previously Presented) The method of claim 67 further comprising:
providing a second queue corresponding to the first MAC device to which data is to be transmitted over the network;
storing at least another portion of the data destined for the at least one of the first MAC device and the client of the first MAC device in the second queue;
and

selectively transmitting data stored in the second queue to the at least one of the first MAC device and the client of the first MAC device; wherein a rate at which the selectively transmitting of data stored in the second queue is performed is based at least in part on one of:
the at least a portion of the information indicating the need to change the amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device; and
at least another portion of the information indicating the need to change the amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device.

69. (Previously Presented) The method of claim 68 wherein the first queue is for data having a first priority level, and wherein the second queue is for data having a second priority level.

70. (Previously Presented) The method of claim 67 further comprising:
providing a second queue corresponding to a second MAC device to which data is to be transmitted over the network;
receiving data destined for at least one of the second MAC device and a client of the second MAC device;
storing at least a portion of the data destined for the at least one of the second MAC device and the client of the second MAC device in the second queue; and
selectively transmitting data stored in the second queue to the at least one of the second MAC device and the client of the second MAC device; wherein a rate at which the selectively transmitting of data stored in the second queue is performed is based at least in part on information indicating a need to change an amount of data being transmitted to the at least one of the second MAC device and the client of the second MAC device.

71. (Previously Presented) The method of claim 67 wherein the first queue is provided in a memory coupled to at least one of another MAC device and a client of the another MAC device.

72. (Previously Presented) The method of claim 67 wherein the first queue is provided in one of a memory of a second MAC device and a memory of a client of the second MAC device.

73. (Previously Presented) The method of claim 67 wherein the information indicating a need to change the amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device includes at least one of: a MAC device address, a data transmission rate, a ramp factor, a threshold value, a network link bandwidth value, and a flag.

74. (Previously Presented) The method of claim 67 wherein the information indicating a need to change the amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device is received from at least one of the first MAC device, the client of the first MAC device, another MAC device, and a client of the another MAC device.

75. (Previously Presented) The method of claim 67 wherein the selectively transmitting data stored in the first queue further comprises selectively transmitting data stored in the first queue in one of a first egress direction and a second egress direction.

76. (Previously Presented) The method of claim 67 further comprising:
receiving information indicating a need to change an amount of data being transmitted on a first network link between the first MAC device and another MAC device; and
selectively transmitting data being selectively transmitted to the at least one of the first MAC device and the client of the first MAC device; wherein another rate at which the selectively transmitting of data being selectively transmitted is performed is based at least in part on at least a portion of the

information indicating the need to change the amount of data being transmitted on the first network link.

77. (Previously Presented) The method of claim 76 wherein the information indicating the need to change the amount of data being transmitted on the first network link includes at least one of: a MAC device address, a data transmission rate, a ramp factor, a threshold value, a network link bandwidth value, and a flag.

78. (Previously Presented) The method of claim 67 further comprising: receiving information indicating a need to change an amount of data being transmitted on a first network link between the first MAC device and another MAC device, wherein the rate at which the selectively transmitting is performed is further based at least in part on at least a portion of the information indicating the need to change the amount of data being transmitted on the first network link.

79. (Previously Presented) The method of claim 67 further comprising: transmitting information indicating a need to change an amount of data being transmitted to at least one of another MAC device and a client of the another MAC device.

80. (Previously Presented) The method of claim 79 further comprising: determining an extent to which a data buffer associated with the client of the another MAC device contains data; and preparing the information indicating the need to change the amount of data being transmitted to the at least one of the another MAC device and the client of the another MAC device.

81. (Previously Presented) The method of claim 67 wherein the network is at least one of a metropolitan area network (MAN) and a resilient packet ring (RPR) network.

82. (Previously Presented) The method of claim 67 wherein the information indicating a need to change an amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device is received in a resilient packet ring (RPR) fairness message.

83. (Previously Presented) The method of claim 67 encoded in a computer readable medium as instructions executable on a processor, the computer readable medium being one of an electronic storage medium, a magnetic storage medium, and an optical storage medium.

84. (Previously Presented) The method of claim 67 wherein the information indicating the need to change the amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device further comprises at least one of: information indicating the need to reduce the amount of data being transmitted, and information indicating the need to increase the amount of data being transmitted.

85. (Previously Presented) An apparatus comprising:
a first media access control (MAC) device operable to be coupled to a network;
a buffer coupled to the first MAC device and operable to receive data from the first MAC device;
a packet processor coupled to the buffer;
a first plurality of queues, wherein each of the first plurality of queues corresponds to one of a plurality of respective network stations; and
at least one shaper circuit, the at least one shaper circuit being configured to dequeue data stored in at least one of the first plurality of queues based at least in part on at least a portion of information indicating a need to change an amount of data being transmitted to the respective network station corresponding to the at least one of the first plurality of queues, wherein said information is generated by a client of the network station.

86. (Previously Presented) The apparatus of claim 85 wherein the network is at least one of a metropolitan area network (MAN) and a resilient packet ring (RPR) network.

87. (Previously Presented) The apparatus of claim 85 wherein the buffer has at least one associated threshold value, and wherein at least one of the first MAC device, the buffer, the packet processor, the at least one shaper circuit, and a comparison circuit is further configured to compare the at least one associated threshold value to an indication of an amount of data in the buffer.

88. (Previously Presented) The apparatus of claim 87 wherein at least one of the first MAC device, the buffer, the packet processor, the at least one shaper circuit, and the comparison circuit is further configured to prepare a message including information indicating a need to change an amount of data being transmitted to a network station that includes the first MAC device.

89. (Previously Presented) The apparatus of claim 87 wherein at least one of the first MAC device, the buffer, the packet processor, the at least one shaper circuit, and the comparison circuit is further configured to determine at least one of a data transmission rate and a ramp factor corresponding to a network station that includes the first MAC device.

90. (Previously Presented) The apparatus of claim 85 wherein the first MAC device includes control logic configured to prepare a message for transmission on the network including an indication to change a rate at which data is transmitted to the a network station that includes the first MAC device.

91. (Previously Presented) The apparatus of claim 85 wherein the information indicating the need to change the amount of data being transmitted to the respective network station corresponding to the at least one of the first plurality of queues is received in a resilient packet ring (RPR) fairness message.

92. (Previously Presented) The apparatus of claim 85 further comprising:
a second plurality of queues, wherein each of the second plurality of queues
corresponds to a respective network station, each of the first plurality of
queues is configured to store data having a first priority, and each of the
second plurality of queues is configured to store data having a second
priority.

93. (Previously Presented) The apparatus of claim 92 wherein the at least one
shaper circuit is further configured to dequeue data stored in at least one of the second
plurality of queues based at least in part on at least a portion of information indicating a
need to change an amount of data being transmitted to a respective network station
corresponding to the at least one of the second plurality of queues.

94. (Previously Presented) The apparatus of claim 93 wherein the at least a
portion of the information indicating the need to change the amount of data being
transmitted to the respective network station corresponding to the at least one of the
second plurality of queues is the same as the at least a portion of the information
indicating the need to change the amount of data being transmitted to the respective
network station corresponding to the at least one of the first plurality of queues.

95. (Previously Presented) The apparatus of claim 85 wherein the information
indicating the need to change the amount of data being transmitted to the respective
network station corresponding to the at least one of the first plurality of queues includes
at least one of: a MAC device address, a data transmission rate, a ramp factor, a threshold
value, a network link bandwidth value, and a flag.

96. (Previously Presented) The apparatus of claim 85 wherein the information
indicating the need to change the amount of data being transmitted to the respective
network station corresponding to the at least one of the first plurality of queues is
received from at least one of the respective network station corresponding to the at least
one of the first plurality of queues and another network station.

97. (Previously Presented) The apparatus of claim 85 wherein the shaper circuit is a part of one of the first MAC device and the packet processor.

98. (Previously Presented) The apparatus of claim 85 further comprising: a link shaper circuit, the link shaper circuit being configured to transmit data from at least one of the first plurality of queues based at least in part on at least a portion of information indicating a need to change an amount of data being transmitted on a network link between a first network station and a second network station.

99. (Previously Presented) The apparatus of claim 98 wherein the information indicating the need to change the amount of data being transmitted on the network link includes at least one of: a MAC device address, a data transmission rate, a ramp factor, a threshold value, a network link bandwidth value, and a flag.

100. (Previously Presented) The apparatus of claim 85 wherein the information indicating the need to change the amount of data being transmitted to the respective network station corresponding to the at least one of the first plurality of queues further comprises at least one of: information indicating the need to reduce the amount of data being transmitted, and information indicating the need to increase the amount of data being transmitted.

101. (Previously Presented) An apparatus comprising:
a first means for receiving and queuing data destined for one of a plurality of network stations, wherein
each of the plurality of network stations has a corresponding means for receiving and queuing data;
a first means for receiving information indicating a need to change an amount of data being transmitted to a client of the network station, wherein said information is generated by the client of the network station; and
a first means for selectively transmitting data stored in the first means for receiving and queuing to the network station, wherein

a rate at which the first means for selectively transmitting data transmits data is based at least in part on at least a portion of the information indicating the need to change the amount of data being transmitted to the client of the network station.

102. (Previously Presented) The apparatus of claim 101 further comprising: a second means for receiving and queuing data destined for the network station.

103. (Previously Presented) The apparatus of claim 102 wherein the first means for selectively transmitting data is further for selectively transmitting data stored in the second means for receiving and queuing to the network station.

104. (Previously Presented) The apparatus of claim 101 wherein the information indicating the need to change the amount of data being transmitted to the network station includes at least one of: a MAC device address, a data transmission rate, a ramp factor, a threshold value, a network link bandwidth value, and a flag.

105. (Previously Presented) The apparatus of claim 101 further comprising: a second means for receiving information indicating a need to change an amount of data being transmitted on a network link between a first network station and a second network station; and a second means for selectively transmitting data transmitted by the first means for selectively transmitting data, wherein a rate at which the second means for selectively transmitting data transmits data is based at least in part on at least a portion of the information indicating the need to change the amount of data being transmitted on the first network link.

106. (Previously Presented) The apparatus of claim 105 wherein the information indicating the need to change the amount of data being transmitted on the first network link includes at least one of: a MAC device address, a data transmission rate, a ramp factor, a threshold value, a network link bandwidth value, and a flag.

107. (Previously Presented) The apparatus of claim 101 further comprising:
a means for transmitting information indicating a need to change an amount of
data being transmitted to another network station.

108. (Previously Presented) The apparatus of claim 107 further comprising:
a means for determining an extent to which a means for buffering contains data;
and
a means for preparing the information indicating a need to change an amount of
data being transmitted to another network station.

109. (Previously Presented) The apparatus of claim 101 wherein the information
indicating the need to change the amount of data being transmitted to the network station
further comprises at least one of information indicating the need to reduce the amount of
data being transmitted, and information indicating the need to increase the amount of data
being transmitted.

110. (Previously Presented) A computer readable medium comprising program
instructions executable on a processor, the computer readable medium being at least one
of an electronic storage medium, a magnetic storage medium, and an optical storage
medium, wherein the program instructions are operable to implement each of:
for each of a plurality of media access control (MAC) devices to which data is to
be transmitted over a network, providing a corresponding queue;
receiving data, from a local client, destined for a client of a first MAC device of
the plurality of MAC devices;
storing at least a portion of the data in a first queue corresponding to the first
MAC device;
receiving information generated by the client of the first MAC device indicating a
need to change an amount of data being transmitted to the client of the
first MAC device; and
selectively transmitting data stored in the first queue to the first MAC device,
wherein

a rate at which the selectively transmitting is performed is based at least in part on at least a portion of the information indicating the need to change the amount of data being transmitted to the client of the first MAC device.

111. (Previously Presented) The computer readable medium of claim 110 further comprising program instructions operable to implement:

providing a second queue corresponding to the first MAC device to which data is to be transmitted over the network;

storing at least another portion of the data destined for the at least one of the first MAC device and the client of the first MAC device in the second queue;
and

selectively transmitting data stored in the second queue to the at least one of the first MAC device and the client of the first MAC device; wherein a rate at which the selectively transmitting of data stored in the second queue is performed is based at least in part on one of:

the at least a portion of the information indicating the need to change the amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device; and

at least another portion of the information indicating the need to change the amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device.

112. (Previously Presented) The computer readable medium of claim 111 wherein the first queue is for data having a first priority level, and wherein the second queue is for data having a second priority level.

113. (Previously Presented) The computer readable medium of claim 110 further comprising program instructions operable to implement:

providing a second queue corresponding to a second MAC device to which data is to be transmitted over the network;

receiving data destined for at least one of the second MAC device and a client of the second MAC device;

storing at least a portion of the data destined for the at least one of the second MAC device and the client of the second MAC device in the second queue; and

selectively transmitting data stored in the second queue to the at least one of the second MAC device and the client of the second MAC device; wherein a rate at which the selectively transmitting of data stored in the second queue is performed is based at least in part on information indicating a need to change an amount of data being transmitted to the at least one of the second MAC device and the client of the second MAC device.

114. (Previously Presented) The computer readable medium of claim 110 wherein the first queue is provided in a memory coupled to at least one of another MAC device and a client of the another MAC device.

115. (Previously Presented) The computer readable medium of claim 110 wherein the first queue is provided in one of a memory of a second MAC device and a memory of a client of the second MAC device.

116. (Previously Presented) The computer readable medium of claim 110 wherein the information indicating a need to change the amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device includes at least one of: a MAC device address, a data transmission rate, a ramp factor, a threshold value, a network link bandwidth value, and a flag.

117. (Previously Presented) The computer readable medium of claim 110 wherein the information indicating a need to change the amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device is received from at least one of the first MAC device, the client of the first MAC device, another MAC device, and a client of the another MAC device.

118. (Previously Presented) The computer readable medium of claim 110 wherein the selectively transmitting data stored in the first queue further comprises selectively transmitting data stored in the first queue in one of a first egress direction and a second egress direction.

119. (Previously Presented) The computer readable medium of claim 110 further comprising program instructions operable to implement:

receiving information indicating a need to change an amount of data being transmitted on a first network link between the first MAC device and another MAC device; and

selectively transmitting data being selectively transmitted to the at least one of the first MAC device and the client of the first MAC device; wherein another rate at which the selectively transmitting of data being selectively transmitted is performed is based at least in part on at least a portion of the information indicating the need to change the amount of data being transmitted on the first network link.

120. (Previously Presented) The computer readable medium of claim 110 wherein the information indicating the need to change the amount of data being transmitted on the first network link includes at least one of: a MAC device address, a data transmission rate, a ramp factor, a threshold value, a network link bandwidth value, and a flag.

121. (Previously Presented) The computer readable medium of claim 110 further comprising program instructions operable to implement:

receiving information indicating a need to change an amount of data being transmitted on a first network link between the first MAC device and another MAC device, wherein the rate at which the selectively transmitting is performed is further based at least in part on at least a portion of the information indicating the need to change the amount of data being transmitted on the first network link.

122. (Previously Presented) The computer readable medium of claim 110 further comprising program instructions operable to implement:

transmitting information indicating a need to change an amount of data being transmitted to at least one of another MAC device and a client of the another MAC device;

123. (Previously Presented) The computer readable medium of claim 122 further comprising program instructions operable to implement:

determining an extent to which a data buffer associated with the client of the another MAC device contains data; and
preparing the information indicating the need to change the amount of data being transmitted to the at least one of the another MAC device and the client of the another MAC device

124. (Previously Presented) The computer readable medium of claim 110 wherein the network is at least one of a metropolitan area network (MAN) and a resilient packet ring (RPR) network.

125. (Previously Presented) The computer readable medium of claim 110 wherein the information indicating a need to change an amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device is received in a resilient packet ring (RPR) fairness message.

126. (Previously Presented) The computer readable medium of claim 110 wherein the information indicating the need to change the amount of data being transmitted to the at least one of the first MAC device and the client of the first MAC device further comprises at least one of: information indicating the need to reduce the amount of data being transmitted, and information indicating the need to increase the amount of data being transmitted.

127. (New) The method of claim 67, wherein
the local client is a device or entity that invokes the service interface of a MAC
device, and
the local client is associated with a station in a ring network.